The USFWS regulations state that by being granted an ITP, the landowner has agreed to grant access to Service staff to property, records, and other areas. [50 CFR 13.21(e)(2) and 13.47.]

The HCP must also meet, with regard to each of the covered species, the following standards from the Services' "Draft Addendum to the Final Handbook for Habitat Conservation Planning and Incidental Take Permitting Process." [Federal Register, 64;45, March 9, 1999]

"The biological outcome of the operating conservation program for the covered species is the best measure of success of an HCP."

"Monitoring is a mandatory element of all HCPs."

"The Services and the applicant must ensure that the monitoring program provides information to: (1) evaluate compliance; (2) determine if biological goals and objectives are being met; and (3) provide feedback to an adaptive management strategy, if used."

"...the scope of the monitoring measures should be commensurate with the scope and duration of the operating conservation program and project impacts."

"The following components are essential...: (1) the implementation and effectiveness of the HCP terms and conditions...; (2) the level of incidental take of the covered species; (3) the biological conditions resulting from the operating conservation program...; and (4) any informational needs of an adaptive management strategy, if utilized."

"The monitoring program will be based on sound science and standard survey or other monitoring protocols previously established...."

"The monitoring program should also clearly designate who is responsible for the various aspects of monitoring."

"Compliance is necessary... Therefore, the Services verify adherence to the terms and conditions of the incidental take permit, HCP, IA, and any other related agreements...."

"...it is important for the Services to make field visits to verify whether the report data are correct and the HCP is being implemented as negotiated."

"For large-scale and/or regional HCPs, oversight committees, made up of representatives from significantly affected entities (e.g., State Fish and Wildlife agencies), are often used to ensure proper and periodic review of the monitoring program...." At 431,000 acres and 50 years in duration, Simpson's proposed HCP would clearly be "large scale."

Response to Comment G3-150

ESA Section 10(a)(2)(A)(iv) requires, as a condition of ITP approval, that a conservation plan specify "such other measures that the Secretary may require as being necessary or appropriate for purposes of the plan." ESA Section 10(a)(2)(B) directs the Services to issue an ITP if it finds that the measures specified under Section 10(a)(2)(A)(iv), if any, will be met and "has received other assurances as he may require that the plan will be implemented." Here, the purposes of the Plan are served by the proposed suite of measures in the Operating Conservation Program and other aspects of Plan implementation, such as the IA.

The obligations set forth in the IA - including the funding provisions (IA Paragraph 7) and remedies, enforcement, penalties and dispute resolution provisions (IA Paragraph 13) - provide additional assurances that the Plan will be implemented. See also Master Response 14 regarding Plan enforceability. Regarding the Services' authority to enter the Plan Area for inspections and monitoring, see IA Paragraph 8.5.

"Oversight committees should periodically evaluate the permittee's compliance with the HCP, its incidental take permit, and IA, and the success of the operating conservation program in reaching its identified biological goals and objectives. Such committees usually include species experts and representatives of the permittee, the Service, and other affected agencies and entities."

"Oversight committees should meet at least annually and review implementation of the monitoring program and filing of reports as defined in the HCP, permit, and/or IA."

"The Services should strive to collect information that will help detect cumulative trends in covered species populations or changes in the quality and/or quantity of the habitat...."

"Effects and effectiveness monitoring will generally include, but are not limited to, the following: 1. Periodic accounting of authorized incidental take; 2. Surveys to determine species status, appropriately measured for the particular operating conservation program (e.g., presence, density, or reproductive rates); 3. Assessments of habitat condition; 4. Progress reports on fulfillment of the operating conservation program (e.g., habitat acres acquired and/or restored); and 5. Evaluations of the operating conservation program and its progress toward its intended biological goals."

"The following represents the minimum information frequently needed in a monitoring program and its reports: 1. Objectives for the monitoring program; 2. Effects on the covered species and/or habitat; 3. Location of sampling sites; 4. Methods for data collection and variables measured; 5. Frequency, timing, and duration of sampling for the variables; 6. Description of the data analysis and who conducted the analyses; and 7. Evaluation of progress toward achieving measurable biological goals and objectives and other terms and conditions as required by the incidental take permit and/or IA."

G3-149

Enforcement and Long-Term Implementation of the HCP

G3-150

ESA ss. 10(a)(2)(A)(iv) and 10(a)(2)(B) state that the Services shall require "...other measures...necessary or appropriate for purposes of the plan" and "...other assurances...that the plan will be implemented." The HCP Handbook's template implementation agreement (IA) also states that the purpose of an IA is to ensure that each item of the HCP is implemented. [USFWS et al (1996), Appendix 4, pp. 3 & 6]

Further, the HCP Handbook also states that enforceable mitigation should be included in HCPs. [USFWS et al (1996), p. 1-16]

The HCP and ITP must be accompanied by a legally sufficient Implementation Agreement (IA).

Simpson must be required to restore damaged habitats, for example, if the company exceeds the allowable level of "take," fails to comply with the HCP's conservation measures, or

otherwise violates the HCP and IA. Simpson should not be indemnified from liability for monetary damages or restorative actions, for failure to implement the HCP's conservation measures and mitigate impacts to the covered species.

The IA must clearly maintain citizens' right to sue for enforcement of the ESA's protection measures for listed species. These measures should be understood to include the HCP's conservation measures, which are being substituted for the ESA's normal protection measures. It is well known that citizen suits have been essential to securing implementation of various aspects of the ESA. The San Bruno plan, the model for the ESA section 10 ITP/HCP process, maintained citizens' enforcement rights.

The Services' HCP Handbook's template IA also states that the purpose of an IA includes providing rights to remedies and relief. The Handbook's template IA includes some limited provisions for injunctive and temporary relief. [USFWS et al (1996), Appendix 4, pp. 3 & 6.] Such provisions are not without precedent. The IA for the Regli Estate HCP grants the Services the right to require restoration of any habitat values that are impacted in violation of the HCP. The Services may also seek damages for some types of violations.

The USFWS' new permit rules state that "a permittee... remains responsible for any outstanding minimization and mitigation measures required under the terms of the permit for take that occurs prior to surrender of the permit and such... even after surrendering the permit...." [50 CFR 17.22(b)(7) and 50 CFR 17.32, as established by June 17, 1999 Federal Register, 64;116.]

The HCP Handbook states that large scale HCPs may also need perpetual funding to cover long term monitoring and mitigation. [USFWS et al (1996), p. 3-24.]

The Service's Handbook states that the landowner should provide up-front legal or financial assurances, such as a letter of credit, if mitigation measures will be implemented after "take" occurs. [USFWS et al (1996), p. 3-22.]

The HCP Handbook anticipates that conservation easements can be used to ensure the HCP "runs with the land." [USFWS et al (1996), p. 6-30]

The USFWS' new permit revocation rule states, in effect, that an ITP will be revoked if the permit would "appreciably reduce the likelihood of the survival and recovery of the species in the wild." [50 CFR 17.22(b)(8) and 50 CFR 17.32, as established by June 17, 1999 Federal Register, 64;116, referring to ESA s. 10(a)(2)(B)(iv).]

G3-150

ESA s. 10(a)(2)(C) states that the Services "...shall revoke a permit...if [they] find that the permute is not complying with the terms and conditions of the permit."

Duration of the ITP

Response to Comment G3-151

The term of the Plan and Permits will be 50 years. Provisions for extending or terminating this term are presented in IA Paragraph 6. The Services believe that the Plan, EIS and IA are consistent with the final Five Points Policy (June 1, 2000, 65 Fed. Reg. 35242), including the guidance relating to permit duration.

Response to Comment G3-152

The HCP approval criteria provide that an ITP is issued to authorize take that is incidental to otherwise lawful activity. The Services are not required to evaluate Green Diamond's compliance with laws as a prerequisite to issuance of this Permit, and no specific information has been provided to the Service that demonstrates that any of the Plan measures are in violation of applicable State and Federal laws. Regarding the regulatory context in which the Plan will be implemented and the Permits will be in effect, see AHCP/CCAA Section 1.4 and EIS Section 1.5.

G3-151

The HCP must also meet, with regard to each of the covered species, the following standards from the Services' "Draft Addendum to the Final Handbook for Habitat Conservation Planning and Incidental Take Permitting Process." [Federal Register, 64;45, March 9, 1999.]

"...when determining incidental take permit duration... factors include duration of the applicant's proposed activities and the expected positive and negative effects on covered species... including the extent to which the operating conservation program will increase the survivability of the listed species and/or enhance its habitat."

"...the Services will also consider the extent of scientific and commercial data underlying the proposed operating conservation program for the HCP, the length of time necessary to implement and achieve the benefits of the operating conservation program, and the extent to which the program incorporates adaptive management strategies."

The Landowner's Eligibility for an ITP

G3-152

ESA ITPs are premised upon the idea that the "take" of species and their habitats will be "incidental to otherwise lawful activities." [See ESA Ss. 10(a)(1)(B) and 10(a)(2)(B)(i) and USFWS et al (1996), p. 1-5.] Thus an ITP/HCP should not be granted for any forest management operation or other land use activity that violates federal, state, or local laws. The Services must assess Simpson's compliance with these requirements.

Furthermore, as per 50 CFR 13.21(b) and (c), 50 CFR 220.21(b), and USFWS et al (1996), p. 7-1, the Services must determine whether Simpson has:

i) been assessed a civil penalty or convicted of any criminal provision of any statute or regulation relating to the activity for which the permit application is filed, if this penalty or conviction evidences a "lack of responsibility;"

ii) failed to disclose material information or made false statements of material fact in connection with the permit application;

iii) failed to demonstrate a valid justification for the permit and a "showing of responsibility;"

iv) violated the Migratory Bird Act, the Lacey Act, or the Bald & Golden Eagle Protection Act; or

v) failed to submit valid, accurate, and timely reports required by their permit.

If the answer to any of these questions is "yes," then the landowner is not eligible to receive or keep a permit under the ESA, Migratory Bird Act, or Bald & Golden Eagle Protection Act.

Response to Comment G3-153

The criteria and standards with which the Plan and EIS must comply are set forth in AHCP/CCAA Section 1.4.1 and EIS Section 1.5, and are discussed in Master Response 8. Use of herbicides and other chemicals are not a covered activity - see Master Response 4 regarding consideration of herbicides in the Plan and EIS. Therefore, the potential impact associated with such use is beyond the scope of the Plan and EIS. In the EIS, see generally Sections 3.4 - Aquatic Resources (*Affected Environment*) and 4.4 - Aquatic Resources (*Environmental Consequences*). In the Plan, see AHCP/CCAA Section 7 (*Assessment of the Conservation Strategy's Effectiveness in Fulfilling the Plan's Purposes*). In addition, as described in the Plan and EIS, the USFWS believes that the benefits to the covered amphibian species from Plan implementation would, if combined with conservation measures applied on other necessary properties, contribute to their status sufficiently to avoid the need to list them under the ESA. The analyses in the Plan and EIS support NMFS' conclusion that, overall, the Plan's extent of mitigation meets the requirements to minimize and mitigate the impacts of taking to the maximum extent practicable.

The Services have concluded that the Plan's conservation measures meet the approval criteria for an ESP/CCAA and an ITP/HCP. The Services believe that the Plan's conservation measures minimize and mitigate individual impacts of take by category and type of impact, and that the activities and management practices under the Operating Conservation Program (AHCP/CCAA Section 6.2) will result in improvements in habitat conditions for the covered species. See Master Response 9 regarding quantifying take. For the reasons set forth in Master

Impact Minimization and Mitigation Measures for Salmon and Other Aquatic and Riparian Species

G3-153

The HCP and DEIS must document whether the HCP's aquatic and riparian conservation measures will fully offset all impacts to the covered aquatic and riparian species, and whether these measures will produce habitat conditions which correspond to the survival and recovery of the covered species. The DEIS and HCP must identify the extent to which "take" of the various covered species will occur. The HCP and DEIS must address water flows and timing, and how they are affected by upslope forest management practices, temperature, the role of invertebrates as food sources and water quality indicators, and the impact of chemical applications, including around upslope intermittent streams. Wetlands, seeps, and springs must be addressed.

G3-154

The HCP's riparian protection measures must, at a minimum, match the compromise standards recommended by NMFS for protecting salmonids in the "westside" forests of the West Coast states. These compromise standards include the NMFS proposal for "short term" HCPs in California (see NMFS (1999)). (See Table 1 below.)

Table 1. Summary of Compromise Aquatic Protection Standards for "Westside" West Coast Forests

NMFS "Short Term HCP" (NMFS (1999))	*Perennial Fish Bearing Streams:* 180 ft. buffer w/ no logging. No chemical applications. Additional buffer on steep slopes. *Perennial NonFish:* Same as perennial fish bearing. *Intermittent Streams:* 30 ft. buffer w/ no logging. Additional buffer to 100 ft. w/ significant retention during logging.
Pacific Lumber HCP	*Perennial Fish Bearing Streams:* 100 ft. buffer w/ no logging. Additional buffer to 170 ft. w/ significant retention during logging. *Perennial NonFish:* 30 ft. buffer w/ no logging. Additional buffer to 130 ft. w/ significant retention during logging. Additional buffer to 170 ft. w/ equipment exclusion. *Intermittent Streams:* 30 ft. buffer w/ no logging. Some exceptions. Additional buffer to 50 to 100 ft. w/ equipment exclusion.

Notes: For comparison purposes only. Does not include all aspects of the different standards.

G3-155

A more credible HCP would employ standards considered to provide reasonable assurances of recovery. These include the standards employed by the Northwest Forest Plan for federal forests in the range of the Northern spotted owl, the standards proposed by Pollock et al (1998), and the "take" avoidance standards identified in the Draft Environmental Impact Statement (DEIS) for the Pacific Lumber Headwaters HCP (USFWS et al (1998)). (See Table 2 below.) It should also be noted that even the Northwest Forest Plan was only considered to have roughly an 80% probability of providing well distributed populations of salmonids across the federal lands in question. (USDA FS et al (1993))

G3-156

USDA FS et al (1993), Huntington (1998), Pollock et al (1998), and the Draft EIS for the Pacific Lumber Headwaters HCP (USFWS et al (1998)) all indicate that buffer widths approaching two site potential trees are necessary to *begin* providing microclimate effects

Response 9, the Services believe that the Plan is consistent with the requirements of the ESA regarding evaluation of take and its impacts. There is no independent requirement under NEPA that the EIS quantify take.

Regarding consideration in the Plan of potential impacts on water resources, see AHCP/CCAA Section 7 (*Assessment of the Conservation Strategy's Effectiveness in Fulfilling the Plan's Purposes*) generally, and more specifically, AHCP/CCAA Sections 7.2.1 (*Potential for Altered Hydrology*), 7.2.2 (*Potential for Increased Sediment Inputs*) and 7.2.5 (*Potential for Altered Water Temperature*), among others. Regarding consideration in the EIS of potential impacts on water resources, see EIS Section 4.0 (*Environmental Consequences*) generally, and more specifically, EIS Sections 4.3 (*Hydrology and Water Quality*) and 4.4 (*Aquatic Resources*). The primary water quality parameters of concern in the Plan Area are suspended sediment, turbidity, and water temperature.

Response to Comment G3-154

The purpose of the ESA Section 10 permitting process is not to compare conservation programs measure for measure, but rather to ensure that the criteria for issuing such permits are met, based upon site-specific, species-specific and activity-specific conditions. The criteria and standards with which the Plan and EIS must comply are set forth in EIS Sections 1.3 and 1.5, and are discussed in Master Response 8. Accordingly, the Permit applicant may propose any suite of measures, and need not "match" the measures proposed in other contexts, so long as the standards are met and criteria are satisfied.

Furthermore, the compromise standards cited in the scoping letter were prepared in the context of short term HCPs. The initial term of this Plan and these Permits is 50 years (AHCP/CCAA 1.3.1) and may be extended in accordance with IA Paragraph 6 (*Term*).

See also Master Response 18 (*Riparian Widths*).

Response to Comment G3-155

As provided in EIS Section 2.6, the Services considered, but did not carry forward for detailed analysis, other alternatives, including application of Federal forest management measures. As discussed in Master Response 8, the Services have concluded that the Plan's conservation measures (AHCP/CCAA Section 6.2) meet the approval criteria for an ESP/CCAA and an ITP/HCP. The criteria are set forth in AHCP/CCAA Section 1.4.1 and EIS Section 1.5. The Services believe that the Plan's conservation measures not only minimize and mitigate individual impacts of take by category and type of impact, but that the activities and management practices under the Operating Conservation Program (AHCP/CCAA Section 6.2 as discussed in AHCP/CCAA Section 6.3) will result in improvements in habitat conditions for the species relative to existing conditions and conditions that are expected to occur over time under the No Action Alternative, and help preclude the need for future listing of the unlisted covered species.

Response to Comment G3-156

See Master Response 18 (Riparian Widths) and Master Response 6 (Relationship between the Green Diamond Plan and the Pacific Lumber Company HCP). See Alternative B (Simplified Prescriptions) described in EIS Section 2.4 and EIS Table 2.7-1 (Description of Alternatives), which compares measures under each of the alternatives..

Response to Comment G3-157

Implementation of the Operating Conservation Program (AHCP/CCAA Section 6.2, as discussed in AHCP/CCAA Section 6.3) will protect intermittent streams. In the Plan, see AHCP/CCAA Sections 6.2.1 (*Riparian Management Measures*), 6.2.2 (*Slope Stability Measures*), 6.2.3 (*Road Management Measures*), 6.2.4 (*Harvest-related Ground Disturbance Measures*) and 7 (*Assessment of the Conservation Strategy's Effectiveness in Fulfilling the Plan's Purposes*). In the EIS, see Section 4.3 (*Hydrology and Water Quality*) and Section 4.4 (*Aquatic Resources*).

Response to Comment G3-158

See the response to Comment G3-157 regarding protection of riparian and other areas through implementation of the Operating Conservation Program. The Services believe that adequate measures for seeps, springs, and other non-stream riparian areas are included in the scope of prescriptions provided in Green Diamond's Operating Conservation Program. As further noted in EIS Section 2.2.3.1 (*Riparian Habitat* under the Proposed Action), ponds, swamps, bogs, springs, and seeps that support aquatic species, including the amphibian covered species, would be afforded the same protection as other Class II watercourses.

Table 2. Summary of Aquatic Protection Standards that Provide a High Probability of Salmonid Recovery in Forested "Westside" West Coast Watersheds

NW Forest Plan	*Perennial Fish Bearing Streams:* 300 ft. buffer w/ no logging. *Perennial NonFish:* 150 ft. buffer w/ no logging. *Intermittent Streams:* 170 ft. buffer w/ no logging.
Pollock et al (1998)	*Perennial Fish Bearing Streams:* 250 ft. buffer w/ no logging. Some exceptions. *Perennial NonFish:* 250 ft. buffer w/ no logging. Some exceptions. *Intermittent Streams:* 105 to 250 ft. buffer w/ no logging. Some exceptions.
NMFS "No Take" (USFWS et al (1998))	*Perennial Fish Bearing Streams:* 340 ft. buffer w/ no logging. *Perennial NonFish:* 170 ft. buffer w/ no logging. *Intermittent Streams:* 100 ft. buffer w/ no logging.

Notes: For comparison purposes only. Does not include all aspects of the different standards

and habitat for riparian species. Amphibians and reptiles comprise a large portion of the ecosystem in all water systems and are an integral part of the food web. Adverse effects to amphibian and reptilian populations can lead to adverse impacts on aquatic species such as salmon and trout. Changes in microclimate conditions can alter the ecosystem of the riparian environment for amphibians, reptiles, and other plant and animal species. Buffer widths that allow increased direct and indirect solar radiation into the riparian zone will increase air temperature and decrease relative humidity in that area. If these measurements move beyond the tolerance levels of terrestrial riparian flora and fauna, these species may perish or be forced to find other suitable habitat to complete their life cycle. Rudolph et al (1990), for example, reported amphibian and reptile populations were significantly lower in aquatic habitats with narrow buffer widths (i.e., those less than 98 ft.) than those with wider buffer strips due to greater shading (i.e., less solar radiation and lower air temperatures) and open understory vegetation.

G3-156

Intermittent streams normally provide important nutrients and food sources for fish and aquatic systems. Conversely, when impacted by logging and roading, these streams can significantly affect stream temperatures, sedimentation, hydrology, and other conditions downstream. The importance of intermittent, upslope streams to downstream fish habitat conditions is noted in USFWS (1999), NMFS (1998), and Reid et al (1999), for example, as well as in NMFS' critical habitat notices for Oregon Coast coho and Upper Columbia steelhead. Streamside trees and other vegetation are needed throughout all stream reaches to prevent erosion and wasting, and large woody debris is needed to help trap sediment, prevent scouring, and maintain other functions.

G3-157

The HCP also needs to include adequate measures for seeps, springs, and other non-stream riparian areas. At a minimum, they should meet the standards recommended by NMFS (1998). More credible standards would include those employed by the Northwest Forest Plan and even the Pacific Lumber HCP. USDA FS et al (1993) and USDA FS et al (1994) recommend no-harvest buffers of 1 to 2 site potential trees (i.e., roughly 170 ft. to 340 ft.) around different types of non-stream riparian areas.

G3-158

Response to Comment G3-159

Regardless of the adequacy of the proposed conservation strategy proposed by NMFS (1998), the USFWS has determined that the measures set forth in the Operating Conservation Program (AHCP/CCAA Section 6.2, as discussed in AHCP/CCAA Section 6.3) for the amphibian covered species meet the issuance criteria for an ESP/CCAA. See EIS Section 1.3 and Master Response 8. The amphibian covered species in the Plan are the southern torrent salamander and tailed frog. See AHCP/CCAA Sections 1.3.3.2 (*ESP Species*), 3.2.2 (*Amphibian Species Characteristics*), 3.3.2 (*Amphibian Habitat Characteristics*) and Appendices A.1.5 (*Tailed Frog*) and A.1.6 (*Southern Torrent Salamander*). Measures addressing these species are set forth in the Operating Conservation Program (AHCP/CCAA Section 6.2) and conclusions regarding the effectiveness of conservation measures are reached in AHCP/CCAA Section 7 - in particular, see AHCP/CCAA Section 7.5 (*Benefits of the Conservation Measures for the ESP Species*). In the EIS, see Section 3.4.5 (*Ecological Implications of Land Management Activities on Aquatic and Riparian Habitat, Fish, and Amphibians*) and Section 4.4.3.7 (*Summary of Effects*).

Response to Comment G3-160

See response to Comment G3-159 and Master Response 8. So long as the Permit issuance criteria discussed in EIS Section 1.3 are satisfied, the ESA does not require that any particular measure, or suite of measures, be included in an operating conservation program. The composition of the suite of measures included in an operating conservation program, including whether to provide

Inadequate measures on smaller streams, intermittent streams, seeps, and springs will lead to adverse impacts on the amphibian populations that are crucial to this habitat. The resulting lack of forest cover means that evapotranspiration rates are likely to increase with increasing air temperature and may contribute to a lowering of the groundwater table and soil moisture content. This may prematurely dry up intermittent streams, depriving flora and fauna of an important water source during the dry season. Intermittent streams also provide important primary habitat for a number of amphibians and other species, including species that do not tend to utilize larger streams as frequently. [American Lands (1998), Benda et al (1998), and USFWS (1998).] Equally important, roading, logging, and other operations within and adjacent to intermittent streams is likely to lead to significant amounts of erosion and sediment loading in downstream channels, including areas needed for salmon spawning and other functions. G3-158

G3-159 USFWS (1998) also found that the aquatic conservation strategy proposed in NMFS (1998) is necessary, and indeed in some respects insufficient, for the conservation of riparian associated amphibians.

G3-160 As recommended by Olson in Benda et al (1998), the HCP also needs to provide long term refugia (or "anchor" habitats) which contain the specific habitat elements needed by different riparian and aquatic habitat associated amphibians. Sites used by the different species need to be inventoried and protected.

G3-161 The HCP must also protect and restore habitats on non-fish-bearing streams which historically supported salmonids and other aquatic and riparian species, or which are otherwise needed for the species' recovery. There is evidence that fish can utilize relatively steep stream reaches when large woody debris provides pools and "stair step" stream structure. [See Trotter (1995) and Montgomery (in preparation).]

G3-162 The HCP and DEIS must mitigate for road densities and resulting impacts. Road densities are also a good indicator of likely impacts to salmonids and other aquatic species as well. Along with clearcutting, high road densities have been documented to result in substantial increases in peak stream flows, including, but not only, during rain on snow events. Peak flow increases of 20% to 50% have been reported in large watersheds as a result of road densities as low as 10% of the watershed area. [Grant (1994) and Grant et al (1996).]

G3-163 The HCP should focus on road obliteration (i.e., restoration of approximate original contour) rather than mere road abandonment. Abandonment may not be sufficient to avoid significant risk of triggering large and cumulative small landslides.

G3-164 The HCP must remediate existing stream crossings which are impassable to fish and/or which are likely to blow out under storm conditions, and protection measures needed for seeps and springs.

long-term refugia or “anchor habitats” for amphibians, lies within the discretion of the Permit applicant.

Response to Comment G3-161

The Plan must meet the requirements of the ESA Section 10 Permit issuance criteria to qualify for approval. See EIS Section 1.3 and Master Response 8. For the reasons discussed in Master Response 8 and based on analyses set forth in the Plan and EIS and discussed throughout these responses to comments, the Services believe that the Plan, including its measures relating to habitat conditions in the Plan Area, meet applicable requirements.

Response to Comment G3-162

See Master Response 17, regarding road density, and AHCP/CCAA Section 6.2.3, as discussed in AHCP/CCAA 6.3.3 regarding the Plan’s road management measures. The Services believe that the Plan’s approach to addressing significant sources of sediment in the Plan Area - including measures to address riparian management, slope stability and harvest-related ground disturbance as well as road management - satisfies the ESA Section 10 Permit approval criteria. See EIS Section 1.3 and Master Response 8 regarding Permit approval criteria.

Response to Comment G3-163

See response to Comment G3-162.

Response to Comment G3-164

The road management measures discussed in AHCP/CCAA Section 6.2.3 include stream crossings (see, e.g., AHCP/CCAA Sections 6.2.3.3.2 and 6.2.3.4.7. Regarding protection for seeps and springs, see the response to Comment G3-158.

Response to Comment G3-165

The Plan's biological goals and objectives are set forth in AHCP/CCAA Section 6.1. Monitoring provisions are set forth in AHCP/CCAA Sections 6.2.5 and 6.2.7, and are discussed further in AHCP/CCAA Sections 6.3.5 and 6.3.7. Adaptive management measures are set forth in AHCP/CCAA Section 6.2.6, and are discussed in AHCP/CCAA Section 6.3.6 and IA Paragraph 10.0.

Regarding water temperature in particular, see AHCP/CCAA Section 6.1.2.1 (*Biological Goals*), Section 6.1.2.2.1 (*Summer Water Temperature Objective*); AHCP/CCAA Section 6.2.5.1.1 and Appendix D.1.2 regarding annual summer water temperature monitoring in Class I and Class II watercourses pursuant to effectiveness monitoring efforts, and AHCP/CCAA Section 6.2.5.1.2 and Appendix D.1.3 regarding BACI water temperature monitoring in selected reaches of Class II watercourses.

Response to Comment G3-166

Herbicide and other chemical use are not covered activities. Regarding chemical application, see Master Response 4 (*Herbicides*). Regarding the scope of analysis in the Plan and EIS (the Proposed Action), the term "covered activities" for the purposes of the Plan and Permits is defined in IA Paragraph 3.3. The covered activities themselves are set forth in AHCP/CCAA Section 1.3.4 and Section 2 and analyzed as part of the "Proposed Action" in the EIS (see, e.g., EIS Section 2.2.1).

Based on the riparian management measures (set forth in AHCP/CCAA Section 6.2.1 and discussed in AHCP/CCAA Section 6.3.1) and other measures included in the Operating

G3-165 The HCP must address temperature and other water quality standards, including by identifying quantified objectives, monitoring indicators, and adaptive management provisions.

G3-166 The HCP must address logging, chemical applications, intensive broadcast burning, and other activities permitted by the ITP across upslope areas, i.e., the majority of the land area in the HCP's covered watersheds. The HCP must provide retention requirements for understory vegetation, green trees, snags, and large woody debris.

G3-167 The HCP and DEIS must include mitigation measures for the hydrological impacts of Simpson's proposed and potential silvicultural practices, as they may be allowed by the ITP. Along with high road densities, frequent, widespread clearcutting has been documented to result in substantial increases in peak stream flows, including, but not only, during rain on snow events. [Grant (1994) and Grant et al (1996).] Recent materials from the US EPA also confirm the importance of addressing "...hydrological maturity/successional issues ...(vegetation patterns/composition/structure) with respect to both peak flows and base flows" for the conservation of native fish, salmonids, amphibians, and other riparian habitat associates. [Moore (1998)]

G3-168 The HCP must include measures to protect groundwater flows from roading and logging operations. Logging can affect groundwater flows by changing water retention timing and rates. Roading can affect groundwater flows by altering geology and soil hydrology.

G3-169 The HCP and DEIS must address the extent and intensity of erosion and sedimentation likely to result from Simpson's upslope logging practices and other sources of soil disturbance across the plan area.

G3-170 The HCP also fails to consistently and thoroughly require reductions in logging, roading, and other impacts on unstable slopes, including slopes at high risk of failure. Substantial amounts of logging are allowed in many slide prone areas. This will often be exactly the opposite of what is needed: retention of the larger trees, to maintain site stability, and to ensure that when failures do occur, large woody debris is delivered to stream channels.

G3-171 The HCP must monitor aquatic invertebrates. The importance and utility of using invertebrates and other biological indicators during water quality assessments and monitoring is discussed in Karr et al (1999), Karr (1998), and Karr (1991). The Oregon plan for conserving coastal coho salmon also establishes basic protocol for using macro-invertebrates as water quality indicators.

G3-172 It should not be assumed that existing watershed analysis processes are sufficient, including where they are being utilized as part of the existing regulatory framework that is incorporated as part of the HCP's mitigation measures.

Conservation Program, as well as the underlying analysis supporting such measures, the Services have determined that the Plan meets the ESA Section 10 Permit issuance criteria discussed in EIS Section 1.3 and Master Response 8. These measures are analyzed in the EIS as part of the Proposed Action. See, e.g., EIS Section 4.3.3.2, discussing large woody debris and EIS Section 4.3.3.3 discussing bank stability.

Response to Comment G3-167

Regarding assessment of potential impacts on hydrology in the Plan, see, e.g., AHCP/CCAA Section 6.2.1 (*Riparian Management Measures*) and Section 6.2.4 (*Harvest-Related Ground Disturbance Measures*). See also AHCP/CCAA Section 7 generally (*Assessment of the Conservation Strategy's Effectiveness in Fulfilling the Plan's Purposes*) and, more specifically, AHCP/CCAA Section 7.2.1 (*Potential for Altered Hydrology*). In the EIS, see Section 4.3 (*Hydrology and Water Quality*) concluding, in part, that implementation of the comprehensive prescriptive measures contained in the Proposed Action would result in equal or slightly improved water quality conditions relative to current conditions and conditions that are expected to occur over time under the No Action Alternative. Based on the analysis in and supporting the Plan and EIS, the Services have determined that the suite of measures in the Operating Conservation Program, including those which address hydrological impacts, satisfy the Permit issuance criteria.

Response to Comment G3-168

The Plan includes harvest-related ground disturbance measures in AHCP/CCAA Section 6.2.6.2.4, as discussed in AHCP/CCAA Section 6.3.4. These measures are assessed in the EIS as part of the Proposed Action (see, e.g., EIS Section 4.2.3.1). Although harvest related ground disturbance could reduce the infiltration capacity and alter the process of subsurface water movement through soil compaction, the harvest-related ground disturbance measures described in the Plan would reduce associated impacts and, thereby, protect groundwater flows.

Response to Comment G3-169

The Plan and EIS address potential environmental effects and impacts of take from erosion and sedimentation associated with the covered activities. Regarding the covered activities, see response to Comment G3-166. See AHCP/CCAA Section 7 (*Assessment of the Conservation Strategy's Effectiveness in Fulfilling the Plan's Purposes*) generally and, more specifically, AHCP/CCAA Section 7.2.2 (*Potential for Increased Sediment Inputs*) and Section 7.5 (*Benefits of the Conservation Measures for the ESP Species*). In the EIS, see Section 3.4.5.4 (*Land Management Activities and Ecological Implications*) and, analyzing the Proposed Action, EIS Section 4.4.3.4 (*Aquatic Habitat*).

Response to Comment G3-170

Regarding harvest rate limitations, see Master Responses 3 (*Cumulative Effects*) and 11 (*Disturbance Index/Rate of Harvest*). Regarding limitations on road density, see Master Response 17. The Plan includes measures to address slope stability. See AHCP/CCAA Section 6.2.2 (*Slope Stability Measures*) as discussed in AHCP/CCAA Section 6.3.2 (*Slope Stability Measures*). See also AHCP/CCAA Appendix B, regarding landslide terminology, and AHCP/CCAA Appendix F, regarding sediment delivery studies and modeling efforts. Potential impacts on unstable slope were analyzed in the EIS as part of the Proposed Action. See EIS Section 4.2.3.2 (*Hillslope Mass Wasting*), where the slope stability conservation measures included under the Proposed Action are described.

Response to Comment G3-171

Monitoring and adaptive management procedures for the Plan's covered species are identified in AHCP/CCAA Section 6.2.5 (*Effectiveness Monitoring Measures*), Section 6.2.6 (*Adaptive Management Measures*), and Section 6.2.7 (*Implementation Monitoring Measures*). These measures are analyzed in the EIS as part of the Proposed Action.

Response to Comment G3-172

Based on the Operating Conservation Program (set forth AHCP/CCAA Section 6.2 and discussed in AHCP/CCAA Section 6.3) and the underlying analysis, the Services have determined that the Plan meets the ESA Section 10 Permit issuance criteria discussed in AHCP/CCAA Section 1.4.1, EIS Section 1.3 and Master Response 8. Further, the "gaps and problems" relating to the Washington watershed analysis process that are identified in the scoping comment are not relevant here, where:

(1) The Plan uses the best scientific and commercial data available. See Master Response 1.3 and AHCP/CCAA Appendix C, regarding studies, surveys and assessments in the Plan Area of covered species and their habitats. See also ACHP/CCAA Section 4.4 regarding assessment of habitat conditions and status of covered species on an HPA-by-HPA basis.

(2) The Operating Conservation Program addresses not only shade and LWD, but also microclimate and sediment inputs. Regarding overstory canopy, see, for example, AHCP/CCAA Sections 6.2.1.2.1 and 6.2.1.4.1; regarding LWD retention, see, for example, AHCP/CCAA Sections 6.2.1.6.2 and 6.2.1.7.5. Regarding microclimate, one of the most important functions of riparian management zones, see AHCP/CCAA Section 6.2.1. Regarding the reduction of sediment input into Plan Area watercourses, see AHCP/CCAA Section 6.2.6.2.2 and Section 6.2.3.

(3) Implementation of the Plan and issuance of the Permits is subject to otherwise applicable requirements, including compliance with anti-degradation standards. See AHCP/CCAA Section 1.4 (*Context*) and EIS Section 1.5.3.3 (applicable State requirements include compliance with the Porter-Cologne Water Quality Control Act and the North Coast Regional Water Quality Control Board's Water Pollution Control Plan, the "Basin Plan." In accordance with Chapter 5 of the Basin Plan (*Plans and Policies*), regional water quality control boards are directed to implement the provisions of several statewide plans and policies, including the Policy with Respect to Maintaining High Quality Waters in California (Resolution No. 68-16).

(4) Regarding hydrologic function, see the response to Comment G3-167.

(5) Influences on water temperature, including air temperature, relative humidity, wind speed and turbidity, will be monitored as part of the in selected sites as part of the Experimental Watersheds Program (AHCP/CCAA Section 6.2.5.4, as discussed in AHCP/CCAA Section 6.3.5.5).

Response to Comment G3-173

Under the Plan, RMZs in the Plan Area will lead to increased age class and size as well as increased total acreage with dense canopy closure. The accelerated development of mid and late-seral stand types as a result of implementation of conservation measures in the Operating Conservation Program is anticipated to be most pronounced within riparian areas. These trends would be expected to result in some long-term benefits to wildlife species that use these habitats. See, for example, EIS Section 4.5.3.1 regarding the general effects of the Proposed Action on vegetation and plant species of concern; EIS Section 4.5.3.2, regarding riparian management effects of the Proposed Action on vegetation and plant species of concern; and Section 4.6, regarding terrestrial habitat/wildlife species of concern and noting that bald eagles, Northern spotted owls and Del Norte salamanders are expected to benefit from the enhanced riparian and late seral forest conditions under the Proposed Action compared to the No Action Alternative.

Regarding the covered species, as discussed in AHCP/CCAA Section 7.2.4.2.1, as assessed in AHCP/CCAA Section 4.3.11 and Appendix C11, presence/absence surveys indicate that southern torrent salamanders and tailed frogs have been identified in 80.3 and 75.0%, respectively, of sampled Plan Area streams in stands that ranged from recent clearcuts to mature second growth (Diller and Wallace 1996 and 1999). This is consistent with studies done in more interior areas to the east of the Plan Area, which identified both torrent salamanders and tailed frogs in 70% and 81%, respectively, of streams in old growth forests. Further, coastal cutthroat trout identified in open stream reaches that had been recently clearcut had similar growth rates to those identified in pristine old growth streams (AHCP/CCAA Section 7.5.1).

The Washington watershed analysis process, which is often upheld as a model, nevertheless suffers from significant gaps and problems. Gaps and problems related to salmonids and bull trout include: 1) lack of assessment of the biotic integrity of waterbodies (e.g., macroinvertebrates); 2) limitation of riparian assessment to shade and large woody debris recruitment from stands adjacent to fish-bearing streams, ignoring other riparian functions such as microclimate, and food chain support and wood recruitment to non-fish channel segments for water quality (i.e. sediment routing) and as source for downstream stream reaches; 3) lack of an antidegradation policy and use-based water quality criteria (i.e., temperature standards) during water quality assessment; 4) during hydrology assessments, lack of consideration of surface/groundwater interactions, groundwater system recharge/discharge areas, subsurface flow and thermal regimes, and hydrologic functions of forest canopy in rain dominated landscapes (i.e. the process assumes the most significant effects of timber harvest on hydrologic processes is through the influence on snow accumulation and melt during rain-on-snow events); and 5) during temperature assessment, inadequate consideration of heat transfer from air to surface water, from soil to shallow groundwater, and from shallow groundwater to streams (i.e. ground/surface water interactions can result in adverse change to surface water temperature, causing potential loss of reach-scale thermal refugia and degrading summer rearing habitat for aquatic biota).

G3-172

Impact Minimization and Mitigation Measures for Species Dependent on Old Growth and Older Forest Habitats:

G3-173

Salmonids and other fish associated with forested watersheds co-evolved with habitat conditions and ecosystem processes that reflected the presence of old growth forests and other mature forest stands across substantial portions of the landscape. The relationship between salmon and forests appears to be truly symbiotic. In addition to being themselves dependent on habitat and watershed conditions associated with older forests, spawning salmonids and their predators and decomposers contributed heavily to the maintenance of soil nutrients and flaura and fauna in riparian zones, which in turn supported future salmon populations. [Lichatowich (1999)]

Restoring mature forest conditions across significant portions of forested watersheds is an essential component of protecting and recovering imperiled salmonids and other native fish species. A combination of forest protection, restoration, and improved management approaches can be used to meet this goal. The adoption of longer timber rotations is an economically-beneficial and "practicable" measure which can be used to supplement other protection and restoration measures by reducing cumulative watershed impacts, helping restore relatively mature forest conditions, and maintaining and even increasing landowners' timber production and revenues.

Failure to protect and restore older forest habitats is likely to impact the survival and recovery of a host of listed and unlisted species, including those not currently found in the plan area, but which will need viable habitats in the area for their recovery. It cannot be assumed that federal lands provide a sufficient basis for species' recovery. Most of the

Presumably resident rainbow trout would have a similar response to timber harvesting activities as coastal cutthroat trout populations; but there have been no specific studies that have examined these effects on the resident form of the rainbow trout (AHCP/CCAA Section 7.5.1).

Information about the covered species is provided in AHCP/CCAA Section 3 and is supplemented with additional detail in AHCP/CCAA Appendix A. See also EIS Section 3.4 (*Aquatic Resources*). An HPA-by-HPA assessment of habitat conditions and the status of covered species, as well as other specific information about the Plan Area, is provided in AHCP/CCAA Section 4 and elements of the "affected environment" are set forth in EIS Section 3.

Regarding the allocation of habitat for listed species on Federal and non-Federal lands, comment noted. Problems associated with implementation of the NWFP are beyond the scope of the Plan and EIS.

habitat for most threatened and endangered species is found on non-federal lands. [GAO (1994)] Moreover, the Northwest Forest Plan for federal forestlands within the range of the Northern spotted owl was only expected to provide an 50% chance of supporting 41% of late successional forest species. (See Table 4 below.)

The Northwest Forest Plan also suffers from implementation problems and an inherent insufficiency for lower elevation forests and many late successional species. Well over half of the amphibian, bird, and mammal species associated with old growth forests in the Pacific Northwest have over half of their habitat on non-federal lands. Specifically, 67% of selected amphibians, 77% of selected birds, and 73% of selected mammals associated with old growth forests have 50% or more of their range on non-federal lands. (See Table 3 below.)

Table 3. Selected Late Successional Forest Species Within the Range of the Northern Spotted Owl That Depend Significantly (>25%) on Non-Federal Forests

Amphibians	Birds	Mammals
>25% Non-Federal Lands:	***>25% Non-Federal Lands:***	***>25% Non-Federal Lands:***
tailed frog	northern goshawk	American marten
Oregon slender salamander	Barrow's goldeneye (smr hab)	Fisher
Shasta salamander	Hammond's flycatcher	Forest deer mouse
Del Norte salamander	flammulated owl	Pacific shrew
Larch Mountain salamander	white headed woodpecker	***>50% Non-Federal Lands:***
>50% Non-Federal Lands:	black backed woodpecker	elk
northwestern salamander	Williamson's sapsucker	western red-backed vole
clouded salamander	***>50% Non-Federal Lands:***	southern red-backed vole
black salamander	wood duck	Townsend's chipmunk
Cope's giant salamander	bufflehead	northern flying squirrel
Pacific giant salamander	hermit thrush	dusky-footed woodrat
Dunn's salamander	brown creeper	shrew-mole
Van Dyke's salamander	Vaux's swift	deer mouse
Cascade torrent salamander	northern flicker	red tree vole
Olympic torrent salamander	hermit warbler	fog shrew
southern torrent salamander	pileated woodpecker	***>75% Non-Federal Lands:***
rough skinned newt	western flycatcher	red tree vole (California)
>75% Non-Federal Lands:	northern pygmy owl	
Columbia torrent salamander	bald eagle	
	varied thrush	
	hooded merganser	
	red crossbill	
	common merganser	
	chestnut backed chickadee	
	hairy woodpecker	
	golden crowned kinglet	
	red breasted nuthatch	
	white breasted nuthatch	
	pygmy nuthatch	
	red breasted sapsucker	
	barred owl	
	winter wren	
	warbling vireo	
	Wilson's warbler	
	>75% Non-Federal Lands:	
	Barrow's goldeneye (wtr hab)	

Source: WAFC (1997d) and USDA FS et al (1993). Notes: The FEMAT Report was developed primarily for management decisions on Federal lands and does not provide thorough analyses for non-Federal lands.

Response to Comment G3-174

The suggestions made based on Kareiva et al. (1999) and others are noted. However, the Services believe the relationship of the Plan's Operating Conservation Program and Green Diamond's commitments to the Plan's biological goals and objectives, as discussed in Master Response 12, are consistent with ESA law and policy for ITPs. The Services' Five Points Policy provides the basis for establishing biological goals and objectives in HCPs.

Response to Comment G3-175

The Operating Conservation Program (AHCP/CCAA Section 6.2) relies on the best scientific and commercial data available (see Master Response 1.3), including the studies and analyses discussed in AHCP/CCAA Section 3 (*Description of the Covered Species and their Habitats*) and Appendix A (*Profile of the Covered Species*); AHCP/CCAA Section 4 (*Description and Assessment of the Current Status of Aquatic Habitat and Covered Species in the Area Where the Plan Will Be Implemented*) and Appendix C (*Studies, Surveys, Assessments of Covered Species and their Habitats Conducted in the Current Plan Area*); and AHCP/CCAA Section 5 (*Assessment of Potential Impacts to Covered Species and their Habitats*) and Appendix E (*Potential Effects of Timber Management on Covered Species and their Habitats*).

Response to Comment G3-176

See the response to Comment G3-100.

Table 4. Likelihood of Late Successional Forest Species Being Well-Distributed Across Federal Lands Under Option 9 of the Northwest Forest Plan

Species Group	# Species w/ 80% Chance or Less	# Species w/ 50% Chance or Less	# Species w/ 25% Chance or Less	Total # Species Studied
Fungi	519	182	99	527
Lichens	145	110	84	157
Bryophytes	1 group	0	0	13 groups
Vascular plants	40	19	12	131
Mollusks	102	99	14	102
Arthropods	10 groups	1 group	0	15 groups
Amphibians	13	5	3	19
Birds	2	0	0	37
Bats	7	2	0	11
Other mammals	4	0	0	12
Fish	6 groups	0	0	7 groups

G3-173

Source: USDA FS et al (1993) and WAFC (d).

Additional Goals and Standards For Forest HCPs

G3-174 The preceding goals and standards are based in part on those identified in Aengst *et al* (1998), Bean et al (1991), Bean (1998), Benda *et al* (1998), Cheever *et al* (1998), Hood *et al* (1998), Kareiva *et al* (1999), Murphy *et al* (1996), and Noss *et al* (1997). Additional goals and standards are provided in these sources. Key goals and standards identified by Kareiva et al (1999) include the following points:

G3-175 Explicit scientific standards need to be developed for HCPs, particularly for larger ones.

G3-176 Independent (and presumably, academic) scientific peer review panels should be consulted during HCP development, particularly for more significant plans.

G3-177 Information on listed species, as well as monitoring data from HCPs should be made accessible in a centralized location, to facilitate better planning and plan evaluation.

G3-178 When basic data on species, their conservation needs, resulting levels and impacts of "take," and other considerations are unavailable, data gaps should be filled *prior* to developing HCPs. Ideally, "take" permits should not be given to landowners when significant information needed to develop scientifically credible HCPs is lacking. Fewer data gaps should be allowed with plans covering larger areas, longer time frames, irreversible impacts, or multiple species.

G3-179 If HCPs proceed in the absence of needed data, then approaches which provide greater levels of certainty for the species should be used.

Simpson North Coast HCP, Scoping Comments
American Lands, p. 35

Response to Comment G3-177

See the response to Comment G3-111.

Response to Comment G3-178

The Plan relies on the best scientific and commercial data available (see Master Response 1.3) and, consistent with the Five Points Policy, the Plan contains monitoring (AHCP/CCAA Sections 6.2.5 and 6.2.7) and adaptive management measures (AHCP/CCAA Section 6.2.6) that will be implemented in response to certain triggers. Green Diamond also will establish an AMRA to allow some adjustments to Plan measures over the term of the Plan and Permits (see AHCP/CCAA Section 6.2.6.3). The provisions in AHCP/CCAA Section 6.2 are discussed in corresponding sections of AHCP/CCAA Section 6.3.

Response to Comment G3-179

The Services note that overall, conservation benefits associated with implementation of the Operating Conservation Program, in particular those associated with acceleration of the road implementation plan (see AHCP/CCAA Section 6.2.3.2.1), will accrue at approximately the same time as, or in advance of, impacts associated with take.

Response to Comment G3-180

See response to Comment G3-178. Further, as explained in AHCP/CCAA Section 7.3 (*Benefits of Monitoring and Adaptive Management*), the monitoring and adaptive management component of the Plan is intended to "monitor all of the key factors (response variables) that have the greatest probability to impact (be limiting for) the covered species and their habitat. The response variables selected were also chosen because they could be quantified with minimum subjectivity, statistically analyzed and used to *modify management in an adaptive manner*." [emphasis added]. See also Master Response 15 (*The Adaptive Management Reserve Account*).

Response to Comment G3-181

See AHCP/CCAA Section 3 (*Description of Covered Species and Their Habitats*), which describes the life history characteristics and habitats of the two amphibian species (southern torrent salamander and tailed frog) and five fish species (Chinook salmon, coho salmon, rainbow trout, steelhead, and coastal cutthroat trout) covered under the Plan. AHCP/CCAA Appendix A (*Profile of the Covered Species*) and Section 4 (*Description and Assessment of the Current Status of Aquatic Habitat and Covered Species in the Area Where the Plan Will Be Implemented*) describe results of habitat and population assessments for covered species in the Plan Area and discuss monitoring of habitat conditions (such as water temperature, channel and habitat type, LWD assessment) and biological surveys (such as fish presence/absence surveys, summer

G3-179 If proposed mitigation measures cannot initially be demonstrated to be effective, then mitigation, monitoring, and evaluation should occur *prior* to "take."

G3-180 Plans must be flexible, to allow for timely improvements based on monitoring results. If monitoring is used to help correct for data gaps, then mitigation measures must be adjusted as needed over time.

G3-181 HCPs -- particularly those covering large areas or large amounts of a species' range -- should inventory, summarize, and document available data on each species and their distribution, abundance, population trends, ecological requirements, life history, and causes of endangerment.

G3-182 Quantitative estimates of the impacts of "take" on species' viability should be provided, especially for larger or more significant plans. At a minimum, best and worst-case scenarios should be identified.

G3-183 Impacts of "take" should also be evaluated, particularly for larger or more significant plans, including by determining whether the habitats being "taken" correspond to population "sources" or "sinks," whether genetically unique subpopulations are being "taken," and whether unique habitat/species combinations are being impacted.

G3-184 The details of HCP mitigation measures must be explicitly described and accompanied by data on their effectiveness. The likely success of each measure must be evaluated, as must the overall effectiveness of mitigation measures at minimizing and offsetting "take."

G3-185 Monitoring provisions should be used to evaluate mitigation measures' performance over time, and to assess impacts to species. Monitoring must be designed to facilitate timely improvements to mitigation measures.

G3-186 HCPs need to quantify the plans' biological goals.

G3-187 HCPs should evaluate the cumulative impacts of multiple plans and their interactions.

G3-188 An HCP's adequacy is questionable if the plan fails to adequately address one or more of the following: species' status reviews, analyzing the proposed "take," assessing the impacts of "take," planning and assessing mitigation measures, and planning and assessing monitoring provisions.

G3-189 HCPs should provide mitigation measures in a timely fashion, preferably before species are affected by "take."

G3-190 HCPs should include contingency measures (i.e., adaptive management supported by monitoring) to address potential failures with mitigation measures.

juvenile salmonid population estimates, salmonid spawning surveys, and headwaters amphibian studies and monitoring).

Response to Comment G3-182

See Master Response 9.

Response to Comment G3-183

The Plan provides analysis of the expected impacts on the covered species of any taking that would be authorized [AHCP/CCAA Section 5 (*Assessment of Potential Impacts to Covered Species and Their Habitats that May Result in Take*)], as well as an analysis of the expected effectiveness of the conservation measures in addressing those effects [AHCP/CCAA Section 7 (*Assessment of the Conservation Strategy's Effectiveness in Fulfilling the Plan's Purposes*)]. Overall, as described in AHCP/CCAA Section 7.4 (*Summary of Mitigation and Minimization of the Impacts of Taking, including Cumulative Impacts*), the proposed activities and management practices under the Operating Conservation Program are expected to improve habitat conditions for the covered species. Based on these sections and the Plan as a whole, the Services believe that the Plan satisfies applicable requirements for HCPs.

Response to Comment G3-184

See the effectiveness monitoring provisions set forth in AHCP/CCAA Section 6.2.5 and discussed in AHCP/CCAA Section 6.3.5. See also AHCP/CCAA Appendix D (*Effectiveness Monitoring Protocols*).

Response to Comment G3-185

Effectiveness monitoring provisions are set forth in AHCP/CCAA Section 6.2.5 and discussed in AHCP/CCAA Section 6.3.5. See also AHCP/CCAA Appendix D, as well as the implementation monitoring measures set forth in AHCP/CCAA Section 6.2.7 and discussed in AHCP/CCAA Section 6.3.7. Effectiveness monitoring results will be used over time to inform the adaptive management process. As discussed in AHCP/CCAA Section 6.3.5 and in IA Paragraph 10, the Rapid Response and Response Monitoring projects form the backbone of the adaptive management process. Each monitoring project has measurable thresholds which, when exceeded, initiate a series of steps for identifying appropriate management responses. To provide the ability to respond rapidly to early signs of potential problems while providing assurances that negative monitoring results will be adequately addressed, a two-stage "yellow light, red light" process will be employed. See AHCP/CCAA Section 7 (*Assessment of the Conservation Strategy's Effectiveness in Fulfilling the Plan's Purposes*) generally and, more specifically, AHCP/CCAA Section 7.3 regarding the benefits of monitoring and adaptive management. See also Master Response 15 (*The Adaptive Management Reserve Account*).

Response to Comment G3-186

See Master Response 12.

Response to Comment G3-187

Cumulative impacts are discussed in Master Response 3 as well as in AHCP/CCAA Section 5.7 (*Summary of Potential Impacts of Take,* Including Cumulative Impacts), Section 7.4 (*Summary of Mitigation and Minimization of the Impacts of Taking*, Including Cumulative Impacts) and Section 7.6 (*Conclusions Regarding Mitigation of Impacts, Provision of Conservation Benefits, and Avoidance of Jeopardy*). In the EIS, cumulative impacts, including with other plans, are discussed in EIS Section 4.1.2.2 (*Approach to Cumulative Effects in this EIS*) and Section 4.1.2.3 (*Other Actions Assessed in the Cumulative Impacts Analysis*).

Response to Comment G3-188

The status of the Covered Species is described in AHCP/CCAA Section 4. See also AHCP/CCAA Appendix A (Profile of the Covered Species) and Appendix C (Studies, Surveys, Assessments of Covered Species and their Habitats Conducted in the Current Plan Area), and Master

Response 9 (Quantifying Take). Assessment of the impacts of take is provided in AHCP/CCAA Section 7 and Appendix E, and EIS Section 4. Mitigation and monitoring provisions are provided in AHCP/CCAA Section 6.2 and are discussed in AHCP/CCAA Section 6.3. Effectiveness of the monitoring protocols is discussed in AHCP/CCAA Appendix D. Based on the analysis in and supporting the Plan, the Services believe that the Plan satisfies the requirements of the Permit issuance criteria discussed in EIS Section 1.3 and Master Response 8.

Response to Comment G3-189

See the response to Comment G3-179.

Response to Comment G3-190

See the response to Comments G3-178, G3-180, and G3-185.

G3-191 [The percentage of local *and* global populations that will be "taken" should be assessed.

G3-192 [Managers should adopt risk-averse strategies in the face of uncertainty.

G3-193 [Where possible, assertions made in HCPs should be supported by quantitative information.

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Response to Comment G3-191

See Master Response 9.

Response to Comment G3-192

The Operating Conservation Program and IA include measures to address changed circumstances, unforeseen circumstances and monitoring results over time. See AHCP/CCAA Sections 6.2.9 and 6.3.9 (*Measures for Changed Circumstances*), AHCP/CCAA Section 6.2.10 and IA Paragraph 4.3 (*Measures for Unforeseen Circumstances* and *Interim Obligations upon a Finding of Unforeseen Circumstances*, respectively) and response to Comment G3-109. The Services believe that these measures, together with other aspects of the Plan, satisfy the requirements for Permit issuance.

Response to Comment G3-193

Many quantitative assessments support information provided in the Plan. See, e.g. AHCP/CCAA Appendix C.

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